

What is claimed is:

1. A method for manufacturing an optical waveguide device, the method comprising:

disposing a plurality of optical waveguides on a first substrate in a matrix, each of the plurality of optical waveguides comprising a core having a selected number of branch points N for propagating light, and a cladding layer surrounding the core, wherein each length of sides of each grid in the matrix being X and Y, and a length of the core extending in the X direction being Z;

disposing a plurality of functional portions on a second substrate;
joining the first substrate and the second substrate together so that each of the plurality of optical waveguides opposes to a respective one of the functional portions;

forming a plurality of grooves at each of the branch points, the distance between the grooves being P and the angle of each of the grooves being θ ($0^\circ < \theta < 90^\circ$), such that the following formulas are satisfied:

$$X = M \cdot P / \sin \theta \text{ (where } M \text{ is natural number)}$$

$$Y = P / \cos \theta$$

$$Z \leq (N+1) \cdot P / \sin \theta; \text{ and}$$

dividing the joined first and second substrate to a respective optical waveguide device.

2. A method for manufacturing an optical waveguide, the method comprising:

disposing a plurality of optical waveguides on a first substrate in a matrix, each of the plurality of optical waveguides comprising a core having a selected number of branch points N for propagating light, and a cladding layer surrounding the core,

wherein each length of sides of each grid in the matrix being X and Y, and a length of the core extending in the X direction being Z;

forming a plurality of grooves at each of the branch points, the distance between the grooves being P and the angle of each of the grooves being θ ($0^\circ < \theta < 90^\circ$), such that the following formulas are satisfied:

$$X = N \cdot P / \sin \theta$$

$$Y = P / \cos \theta; \text{ and}$$

dividing the first substrate to a respective optical waveguide.

3. An optical waveguide device manufactured by the method for manufacturing the optical waveguide device according to claim 1.

4. An optical waveguide manufactured by the method for manufacturing the optical waveguide according to claim 2.

5. An optical communication apparatus comprising:
the optical waveguide device according to claim 3, wherein the optical waveguide device having a light emitting device and a light receiving device;
a light emitting device drive circuit for driving the light emitting device; and
a data processing circuit for processing a signal output from the light receiving device.

6. The method according to claim 1, further comprising inserting a plurality of optical filters in the plurality of grooves respectively.

7. The method according to claim 2, further comprising inserting a plurality of optical filters in the plurality of grooves respectively.